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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,827	09/15/2003	Holger Sievert	10191/3204	1196

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KENYON & KENYON
ONE BROADWAY
NEW YORK, NY 10004

EXAMINER

SAYOC, EMMANUEL

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

TALH

Office Action Summary	Application No. 10/662,827	Applicant(s) SIEVERT ET AL.	
	Examiner Emmanuel Sayoc	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-8, 10-13 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 5, 9 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/15/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4, 6, 8, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 4, it is unclear how a DC-voltage component creates a low frequency interference since DC-voltage, like any DC signal, has no frequency component.

The lack of rejection on prior art of claims 4 and 8 is not an indication of allowability, but just an inability to determine patentability based on prior art.

Patentability will be determined upon clarification of these claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3, 7, 11-13, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch et al. (U.S. 4,492,524) Thompson et al. (U.S. 5,678,521), and Krutz et al. (U.S. 4,679,488).

In Figure 3 Koch et al. teach a piston pump driven by an electric motor (23). Cam (28) rotates to provide reciprocation to pistons (7).

Although the reference does not teach a fluid reservoir, reservoirs or storage tanks were well known to be used in conjunction with tanks to store the pressurized fluid in a ready state for an end user. Thompson et al. teach an analogous cam driven piston pump (14) with a pressure reservoir (12). Therefore it would have been obvious to one of ordinary skill in the art to modify the Koch et al. device by connecting the pump outlets (14) to a fluid reservoir, as taught by Thompson et al., in order to advantageously be able to store the pressurized fluid in a ready state for an end user.

As stated in Koch et al., column 2 lines 13-22, and lines 52-68, the outlet pressure of the pump fluctuates as a result of the non-linear eccentric drive, and that the pressure is used to control the speed of the pump. In other words the regulating system

varies the speed of the motor depending on the mean pressure of the pumped fluid. In column 4 lines 3-26 the reference states that a pressure output signal is generated which includes a high-pass filtration step (filter out low frequency interference). The speed of the stepper motor (23) is varied by varying the frequency of the current pulse source, where the frequency of the pulses is proportional to the speed of the motor. Similar to Koch et al., the Thompson et al. device has a pressure sensor (22) placed in the reservoir (12). It is evident that in the combination, the Koch et al. pressure sensor pressure reading is proportional to, if not equal to, the pressure in the reservoir.

The Koch et al. device further differs in that there is no teaching of determining pressure peaks within the pressure signal and determining the speed of the pump motor based on the frequency of the pressure peaks. Krutz et al. teaches a process and apparatus for determining motor speed based on peaks in a pressure signal see column 2 lines 22-47. Krutz et al. teaches a hydraulic motor (10) and pressure sensor (11) that senses pressure in motor lobes. In columns 5 lines 31 to column 6 line 35, the pressure signal correlation to speed is described. Basically signal characteristics such as peaks occurring at regular intervals (frequency) correspond to the certain amounts of rotor displacement. Pressure peak signals are shown in Figures 12-14. Column 10 lines 9-66 show the calculation of rotor/shaft velocity (magnitude of which is speed) using displacement and time data derived from the pressure signal. The displacement is derived from specific signal peak and dip characteristics in the pressure signal. In the description of instrumentation, column 7 lines 42-60, a low-pass filter is included for removing high frequency noise. Obtaining the speed of the motor from the pressure

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signal as discussed above is an accurate means of determining motor speed without a conventional speed sensor. This process of speed determination is not affected by physical characteristics such as load fluctuations, fluid viscosity, and back pressure, as these factors are reflected in the pressure signal. In Koch et al., the speed of the motor is determined by the frequency of the supplied current pulses. Under normal steady state flow this may be sufficient but physical forces acting against the motor rotor may skew this estimation. For example if "W" frequency of "X" amplitude pulses produces an estimated motor speed of "Y" under ideal conditions, "W" frequency of "X" amplitude pulses would realistically produce a motor speed of Y-Z during elevated fluid viscosity or back pressure, or excessive load, or increased motor resistance due to normal wear, where Z is the speed loss due to the stated physical conditions. It is acknowledged that the speed determination process in Krutz et al is applied to a hydraulic motor, however one of ordinary skill in the art would have appreciated that this process can be applied to any rotary application that produces a characteristic pressure signal during rotational operation. One would simply apply pressure sensors at the pressure source, in the case of a pump it would be the discharge pressure. In the presence of a fluid reservoir, as stated above, the discharge pressure would be proportional if not equal to the fluid pressure in the reservoir. Therefore it would have been obvious to one of ordinary skill in the art at time the invention was made to modify the Koch et al. device by, incorporating the pressure signal speed determination means, as taught by Krutz et al., in order to advantageously determine the speed of the motor more accurately and therefore be able to better adjust speed based on pressure accordingly. Signal filtration

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was well known in the art to remove signal interference, noise, and extraneous signals, that otherwise serve no value in signal analysis. In this combination it would have also been obvious to preserve the teachings of low and high pass signal filtration to advantageously obtain a more robust pressure signal indicative of motor operation.

Allowable Subject Matter

6. Claims 5, 9, and 14 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 6, and 10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to pump speed determination and control.

U.S. Pat. 5,664,937 to Takahashi et al., and 4,965,713 to Hong et al. – teach piston pumps with pressure signals used to control motor speed

U.S. Pat. 6,276,134 B1 to Matsuyama et al. – teach a piston pump with pressure signals used to control motor speed

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Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Sayoc whose telephone number is (571) 272 4832. The examiner can normally be reached on M-F 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on (571) 272-4444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Emmanuel Sayoc
Examiner
Art Unit 3746

ECS